



INTERNATIONAL FLAME RESEARCH FOUNDATION

2023

ANNUAL REPORT

Including financial statements



Legal status:

Company Limited by Guarantee; Company Registration No. 10573161

Registered office:

Translational Energy Research Centre, Sheffield Business Park, Europa Avenue, S9 1ZA

Bank:

Lloyds TSB Bank, Sheffield Church Street, Chelmsford Legg St OSC,
1 Legg St, Essex, CM1 1JS, UK

IFRF Council

Directors of IFRF Ltd (Group A)

General Secretary - Mohamed Pourkashanian*
Executive Director - Greg Kelsall

Non-Directors of IFRF Ltd (Group B)

President - Sauro Pasini*
IFRF Vice President - International - Sébastien Caillat
Company Secretary - Melissa Ayres

National Committee Representatives

America - Dave Schalles
China - Yong Yan
France - David Honoré, Vice-Chair
Germany - Reinhold Kneer
Italy - Massimiliano Fantuzzi
Netherlands - Rob Bastiaan
Sweden - Nils Skoglund

New fuels - Chuck Benson*
Safety - Jacques Dugué
Early Career Researchers - Karen Finney
Academia - Miko Hupa
Regional (Asia) - Yong Yan

*Member of Executive Committee



IFRF in 2023: Positive signs consolidating

This year has flown by, and it is already time to write down the president's thoughts on the state of the Foundation. I'm much more relaxed than last year, when I compared the path of the Foundation to that of someone "walking on the crest of a mountain": all the positive signs that were highlighted in 2022 have consolidated, and the situation and prospects of the Foundation have certainly improved.

I must recognize that a fundamental role was certainly played by the staff made available by the University of Sheffield that, thanks to the coordination of the director Greg Kelsall and the supervision of Prof. Mohamed Pourkashanian, allowed to manage in an effective and proactive way all the aspects of the day-by-day operation: communication to the members, administrative and financial management, support to the National Committees in the organization of the events, identification of an operational strategy - when in a machine the engine is good and efficient, a lot is already done!

A special mention goes also to the National Committees, first of all the French one, who conceived, organized and successfully completed events on innovative topics in the world of energy, such as Alternative Chemical Energy Carriers and restoring dignity to conventional (but always stimulating) topics in the IFRF's DNA, such as the scale-up from lab-scale to industrial combustion.

In this context, the Italian Committee should also be mentioned, which managed to gather participants from ten different countries to



discuss the issues of decarbonization in hard-to-abate sectors.

The innovative issues on which there is the desire and the need to discuss, at least at a pre-competitive level, exist and are numerous; there is a need for a constructive discussion between those who do basic research and those who are interested in industrial issues, demonstrated by the increasingly close relationships that are being recreated between the IFRF and the world of the Combustion Institute.

Among the sectors of greatest strategic interest, I see that of new "synthetic fuels", driven both by the processes of decarbonization of mobility and by the attempt to store excess energy produced by renewables.

PRESIDENT'S REPORT



Made from waste, biomass or direct reactions between renewable hydrogen and CO₂, they are chemically similar to conventional fossil fuels, but need to be characterized in terms of combustion behavior, both for their certification and to understand how they will behave in combustion systems.

Large industrial burners will lose importance, attention will be concentrated more on engines and gas turbines, but the characterization processes are still the same and fall well within the field in which the IFRF has extensive know-how and now, thanks to the preferred research partners, starting with TERC, also numerous experimental facilities for testing.

I believe that there are all the conditions to look optimistically and positively to the future. There has been an increase, even in the presence of important defections, in the number of members of the Foundation, the activity of the TOTeMs is now consolidated and always sees extensive, interested and active participation.

Some National Committees have come closer again and a new interesting sector is opening up in the field of training, thanks also to new synergies defined with the Portuguese of Cenertec, specialists in this sector.

There are two clear signs of this newfound optimism: the first is certainly the organization, after several years, of the Members Conference, the key event in the life of the foundation, which will take place in Sheffield in June 2025, please start planning to attend!

The second one is the event planned in Paris in March 2024, to revitalize the strategy of



IFRF and reunite its members, where the objectives of the IFRF, the governance structure and upcoming collaborative R&D funding opportunities were discussed and redefined.

The outcome of this meeting will certainly be the starting point to define, with the collaboration of all the Members, the lines of development of the foundation in the future, and I'm quite optimistic on the final result.

Sauro Pasini, IFRF President



2023: The recovery continues

In my Director's Report for 2022, I described a "year of consolidation with the first signs of recovery". 2023 has seen the recovery continue with IFRF moving in to a much more stable financial position, through a mixed portfolio of income generation focused on technical events and member subscriptions.

Looking first at IFRF's technical programme; a number of technical meetings and workshops were held in 2023:

- IFRF 1-day satellite workshop entitled 'From lab-scale to industrial combustion: challenges for the scale up of experimental and simulation approaches', held at the 11th European Combustion Meeting in Rouen, France on 25 April 2023. The workshop focused on the stationary industrial sectors of steel, glass, cement, power production, biomass and wastes as fuel, including 2 keynote presentations. It was well attended with 63 people from 11 countries joining, split 42%/58% across industry and academia.
- TOTeM 49 entitled 'Alternative chemical energy carriers for long-term storage and long-distance transport of renewable energies' was held on 14-15 June 2023 in Mulhouse, France. Attended by some 50 participants, it discussed carbon-free energy focusing on powdered metals and ammonia.
- TOTeM 50 entitled 'Decarbonising combustion in hard-to-abate sectors' was held on 5-6 December 2023 at the Politecnico di Milano in Piacenza, Italy. The TOTeM was very well attended with 86 delegates from 52 individual organisations which were spread across 10 countries. Industrial attendance was high at 77% of the total delegates, reflecting the importance of the decarbonisation topic to the foundation industries.
- Patrick Lavery was invited to attend the Brisbane Hydrogen Workshop on 22-25 May 2023, jointly hosted by the Japan-based IERE and Australia's Commonwealth Science and Industrial Research Organisation (CSIRO). Patrick was one of the event's three keynote speakers/ His involvement was part of the IFRF initiative to develop improved links with Japanese companies and organisations.



DIRECTOR'S REPORT



In terms of membership, a number of organisations in France, namely Cetiat, Cerfacs, IFP Energies Nouvelles (IFPEN) and Babcock Wanson joined as members starting from January 2023.

Additionally, the German Flame Committee with 14 members, who had previously suspended payment of their membership fees in 2021, returned as a fee-paying IFRF National Committee in 2023. This was at a reduced rate however, pending continued development of the IFRF offering. This rate was reviewed subsequently at the German Flame Committee (DVV) meeting in September 2023, but due to uncertainties in the financial position of the committee, it was decided to remain at this reduced membership level for the upcoming 2024.

The American Flame Research Committee (AFRC), having also suspended its membership of IFRF in 2021, agreed for its individual members to have the option to rejoin as IFRF members in 2024. It is expected that at least two members of the AFRC will rejoin in 2024.

Further organic growth of the IFRF membership is planned in 2024 with Amatek Land, Cenertec, GRDF and Danieli all confirmed as new industrial members. The only negative on IFRF membership was the news in late 2023 that Delft University in The Netherlands will cancel its membership for 2024. As the lead of the Dutch Flame Committee (NVV), this has effectively ended for now the role of NVV as an IFRF National Committee. Shell, as the only remaining Dutch-based member, will join the IFRF Associate Member Group.

In terms of communications, IFRF has continued to publish Monday Night Mail, our biweekly newsletter with a circulation of approximately 1000 and an open-rate of typically 30%. Additionally, an IFRF LinkedIn Group is also provided as a second communication channel. This group had 550 members at the end of 2023, growing at around 15% per year.

Ease of access to the online IFRF Combustion Journal (ISSN 2075-3071) has been improved with Journal papers now indexed via Elsevier Scopus. The Combustion Journal provides free access to 104 papers focusing on the practical and theoretical aspects of combustion science in industrial applications.

Finally, the first steps to re-establish the IFRF Handbook have been made. This is a free-to-access online collection of more than 200 combustion files, designed to answer three generic questions: "What is x?", "How do I y?" and "What data is available for z?" All combustion files are now published on the IFRF website with increased search functionality.

Outlook for 2024

The technical programme of the IFRF will continue to be developed, to include TOTeM meetings, joint offerings with external organisations such as Cenertec and the new COST Cypher EU project, and a Hydrogen combustion training course. This training course will be held at the Translational Energy Research Centre (IFRF's host organisation/Preferred Research Partner) in Q4 of 2024.

DIRECTOR'S REPORT



IFRF's improved financial position allows us to again plan for the IFRF Conference. Last held in 2018, this is intended to be a three-day event to be held in Sheffield, UK during 2025. It will include paper and poster sessions, an optional tour of the TERC test facilities and a special session on the outcomes and work in progress of EU co-funded projects related to industrial combustion in hard to abate sectors.

Further consolidation of the IFRF Preferred Research Partner network is planned with SINTEF in Sweden joining the network from January 2024. They are the seventh organisation in the network, providing potential access to three of their pressurised combustion, chemical looping combustion and gas turbine demonstration test facilities to IFRF member and supporting organisations.

IFRF will also work with its members and PRP organisations to explore opportunities to bid for externally funded collaborative research, primarily through the EU Horizon programme. Based on feedback from members, this is seen as an important IFRF offering.

Greg Kelsall, Executive Director



MEMBERS

IFRF has members in each corner of the world, from the USA to Japan, and from Finland to South Africa.

Here is how the IFRF Membership looked at the end of 2021:

6 National Committees



22 Countries



130 Members



124 Organisations
8 Individuals
52 Large industrial
20 Small industrial
51 Academic



COMMUNICATIONS

IFRF has three main platforms for communicating with its members and beyond. Monday Night Mail (MNM) a bi-weekly member e-newsletter; the IFRF website (www.ifrf.net); and social media pages.

MONDAY NIGHT MAIL

IFRF'S BI-WEEKLY MEMBER NEWSLETTER

920

**subscribers at the
end of 2022**

25

MNMs published

27.1%

**subscribers engaged
with MNM on average**

Top 10 stories of 2023

1. Preliminary announcement of IFRF's 50th TOTeM
2. Fives launches its first 100% hydrogen duct burner
3. IFRF publishes its 2021 Annual Report
4. IFRF Workshop entitled 'From lab scale to industrial combustion: challenges for the scale up of experimental and simulation approaches' held at the 11th European Combustion Meeting
5. Reminder that IFRF supplies in-flame measurement probes
6. IFRF Workshop at the 11th European Combustion Meeting
7. TOTeM 50 – Decarbonising combustion in hard-to-abate sectors
8. TOTeM 49 – Chemical energy carriers for long-term storage and long-distance transport of renewable energies
9. Netherlands to close Europe's largest gasfield over safety concerns
10. Reflections on the IERE-CSIRO Brisbane Hydrogen Workshop, 22-25 May 2023



EVENTS

- TOTeM 50 - Decarbonising combustion in hard-to-abate sectors - 5-6th December, 2023 in Piacenza, Italy
- TOTeM 49 - Chemical energy carriers for long-term storage and long-distance transport of renewable energies - Mulhouse, France, on 14-15th June 2023
- IFRF Workshop at the 11th European Combustion Meeting - 25th April 2023, Rouen, France - Two keynotes and a workshop are planned with eminent members from industry and academia involved in industrial combustion.

2

TOTeMs

1

Workshop

4

National Committee
Flame Days

National Committee Flame Days

The **Comité Français de la FRIF (France)** had 5 meetings: Two general assemblies, one at Fives Group Headquarters in Paris in January and one at LGRE Laboratory in Mulhouse. FRIF also hosted an Extraordinary General Assembly (with bureau renewal) at CETIAT in Villeurbanne, as well as the workshop mentioned above and TOTeM 49.

The **American Flame Research Committee (AFRC)** held its 2023 Industrial Combustion Symposium on September 25-27th 2023 in Denver, Colorado, USA.

The **Nederlandse Vereniging voor Vlamonderzoek (The Netherlands)** held its annual Combura meeting (Combura2023) on October 23 & 24, 2023 at Domusdela, Kanaalstraat 4, 5611 CT Eindhoven, The Netherlands.

FINANCIAL STATEMENTS



**REPORT OF THE DIRECTORS AND
UNAUDITED FINANCIAL STATEMENTS
FOR THE YEAR ENDED
31 DECEMBER 2023
FOR
IFRF LIMITED**

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022

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FINANCIAL STATEMENTS



IFRF LIMITED

COMPANY INFORMATION FOR THE YEAR ENDED 31 DECEMBER 2023

DIRECTORS:

Dr S Caillat
Professor M Pourkashanian

SECRETARY:

Mrs M J Ayres

REGISTERED OFFICE:

C/O Translational Energy Research Centre
Europa Avenue
Sheffield
South Yorkshire
S9 1ZA

REGISTERED NUMBER:

10573161 (England and Wales)

ACCOUNTANTS:

Bronsens
Chartered Certified Accountants
Hillside
Albion Street
Chipping Norton
Oxfordshire
OX7 5BH

FINANCIAL STATEMENTS



REPORT OF THE DIRECTORS FOR THE YEAR ENDED 31 DECEMBER 2023

The directors present their report with the financial statements of the company for the year ended 31 December 2023.

DIRECTORS

The directors shown below have held office during the whole of the period from 1 January 2023 to the date of this report.

Dr S Caillat
Professor M Pourkashanian

This report has been prepared in accordance with the provisions of Part 15 of the Companies Act 2006 relating to small companies.

ON BEHALF OF THE BOARD:

A handwritten signature in black ink, appearing to read "M. Pourkashanian", is placed over a horizontal dotted line.

Professor M Pourkashanian - Director

Date: 25th July 2024

FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

INCOME STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2023

| | Notes | 31.12.23 £ | 31.12.22 £ |
|--|-------|---------------|---------------|
| TURNOVER | | | |
| Administrative expenses | | 43,808 | 46,238 |
| | | <u>17,312</u> | <u>2,562</u> |
| Other operating income | | 9,489 | - |
| OPERATING SURPLUS and SURPLUS BEFORE TAXATION | | 26,801 | 2,562 |
| Tax on surplus | 4 | 5,092 | 481 |
| SURPLUS FOR THE FINANCIAL YEAR | | <u>21,709</u> | <u>2,081</u> |

The notes form part of these financial statements

FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

**BALANCE SHEET
31 DECEMBER 2023**

| | Notes | 31.12.23 £ | 31.12.22 £ |
|--|-------|---------------|---------------|
| CURRENT ASSETS | | | |
| Debtors | 5 | 10,696 | 8,729 |
| Cash at bank | | 33,784 | 12,490 |
| | | <hr/> | <hr/> |
| | | 44,480 | 21,219 |
| CREDITORS | | | |
| Amounts falling due within one year | 6 | 14,692 | 13,140 |
| | | <hr/> | <hr/> |
| NET CURRENT ASSETS | | 29,788 | 8,079 |
| | | <hr/> | <hr/> |
| TOTAL ASSETS LESS CURRENT LIABILITIES | | 29,788 | 8,079 |
| | | <hr/> | <hr/> |
| RESERVES | | | |
| Income and expenditure account | | 29,788 | 8,079 |
| | | <hr/> | <hr/> |
| | | 29,788 | 8,079 |

The company is entitled to exemption from audit under Section 477 of the Companies Act 2006 for the year ended 31 December 2023.

The members have not required the company to obtain an audit of its financial statements for the year ended 31 December 2023 in accordance with Section 476 of the Companies Act 2006.

The directors acknowledge their responsibilities for:

- (a) ensuring that the company keeps accounting records which comply with Sections 386 and 387 of the Companies Act 2006 and
- (b) preparing financial statements which give a true and fair view of the state of affairs of the company as at the end of each financial year and of its surplus or deficit for each financial year in accordance with the requirements of Sections 394 and 395 and which otherwise comply with the requirements of the Companies Act 2006 relating to financial statements, so far as applicable to the company.

The financial statements have been prepared in accordance with the provisions applicable to companies subject to the small companies regime. The financial statements were approved by the Board of Directors and authorised for issue on 25th July 2024 and were signed on its behalf by:

M Pourkashanian - Director

FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED 31 DECEMBER 2023

| | Retained earnings £ | Total equity £ |
|------------------------------------|------------------------|-------------------|
| Balance at 1 January 2022 | 5,998 | 5,998 |
| Changes in equity | | |
| Total comprehensive income | 2,081 | 2,081 |
| Balance at 31 December 2022 | 8,079 | 8,079 |
| Changes in equity | | |
| Total comprehensive income | 21,709 | 21,709 |
| Balance at 31 December 2023 | 29,788 | 29,788 |

The notes form part of these financial statements

FINANCIAL STATEMENTS



NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2023

1. STATUTORY INFORMATION

IFRF Limited is a private company, limited by guarantee, registered in England and Wales. The company's registered number and registered office address can be found on the Company Information page.

The presentation currency of the financial statements is the Pound Sterling (£).

2. ACCOUNTING POLICIES

Basis of preparing the financial statements

These financial statements have been prepared in accordance with Financial Reporting Standard 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" including the provisions of Section 1A "Small Entities" and the Companies Act 2006. The financial statements have been prepared under the historical cost convention.

Turnover

Turnover is measured at the fair value of the consideration received or receivable, excluding discounts, rebates, value added tax and other sales taxes.

Tangible fixed assets

Depreciation is provided at the following annual rates in order to write off each asset over its estimated useful life.

Taxation

Taxation for the year comprises current and deferred tax. Tax is recognised in the Income Statement, except to the extent that it relates to items recognised in other comprehensive income or directly in equity.

Current tax is recognised at the amount of tax payable using the tax rates and laws that have been enacted or substantively enacted by the balance sheet date.

Deferred tax

Deferred tax is recognised in respect of all timing differences that have originated but not reversed at the balance sheet date.

FINANCIAL STATEMENTS



Timing differences arise from the inclusion of income and expenses in tax assessments in periods different from those in which they are recognised in financial statements. Deferred tax is measured using tax rates and laws that have been enacted or substantively enacted by the year end and that are expected to apply to the reversal of the timing difference.

Unrelieved tax losses and other deferred tax assets are recognised only to the extent that it is probable that they will be recovered against the reversal of deferred tax liabilities or other future taxable profits.

3. EMPLOYEES AND DIRECTORS

The average number of employees during the year was 2 (2022 - 2).

FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

NOTES TO THE FINANCIAL STATEMENTS - continued FOR THE YEAR ENDED 31 DECEMBER 2023

4. TAXATION

Analysis of the tax charge

The tax charge on the surplus for the year was as follows:

| | 31.12.23 | 31.12.22 |
|------------------------------------|-----------|----------|
| | £ | £ |
| Current tax: | | |
| UK corporation tax | 5,092 | 487 |
| Under/(over) provision prior years | - | (6) |
| Tax on surplus | 5,092 | 481 |

5. DEBTORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

| | 31.12.23 | 31.12.22 |
|---------------|----------|----------|
| | £ | £ |
| Trade debtors | 10,696 | 8,729 |

6. CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

| | 31.12.23 | 31.12.22 |
|------------------|------------|----------|
| | £ | £ |
| Trade creditors | 4,698 | 8,386 |
| Tax | 5,092 | 487 |
| Accrued expenses | 4,902 | 4,267 |
| 14,692 | 13,140 | |

8. LIMITED BY GUARANTEE

The company is Limited by Guarantee. Accordingly the company has no shareholders and no reconciliation of movement in shareholders' funds is present. The liability of each member shall not be more than £1 in the unlikely event of the company being wound up.

FINANCIAL STATEMENTS



ON THE UNAUDITED FINANCIAL STATEMENTS OF IFRF LIMITED (REGISTERED NUMBER: 10573161)

In order to assist you to fulfil your duties under the Companies Act 2006, we have prepared for your approval the financial statements of IFRF Limited for the year ended 31 December 2022 which comprise the Income Statement, Balance Sheet, Statement of Changes in Equity and the related notes from the company's accounting records and from information and explanations you have given us.

As a practising member firm of the Association of Chartered Certified Accountants, we are subject to its ethical and other professional requirements which are detailed at <http://www.accaglobal.com/rulebook>.

This report is made solely to the Board of Directors of IFRF Limited, as a body, in accordance with our terms of engagement. Our work has been undertaken solely to prepare for your approval the financial statements of IFRF Limited and state those matters that we have agreed to state to the Board of Directors of IFRF Limited, as a body, in this report in accordance with the requirements of the Association of Chartered Certified Accountants as detailed at <http://www.accaglobal.com/factsheet163>. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and its Board of Directors, as a body, for our work or for this report.

It is your duty to ensure that IFRF Limited has kept adequate accounting records and to prepare statutory financial statements that give a true and fair view of the assets, liabilities, financial position and profit of IFRF Limited. You consider that IFRF Limited is exempt from the statutory audit requirement for the year.

We have not been instructed to carry out an audit or a review of the financial statements of IFRF Limited. For this reason, we have not verified the accuracy or completeness of the accounting records or information and explanations you have given to us and we do not, therefore, express any opinion on the statutory financial statements.

Bronsens
Chartered Certified Accountants
Hillside
Albion Street
Chipping Norton
Oxfordshire
OX7 5BH

Date:25 July 2024.....

This page does not form part of the statutory financial statements

FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

**DETAILED INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31 DECEMBER 2023**

| | 31.12.23 | 31.12.22 |
|---------------------------------------|---------------------|---------------------|
| | £ | £ |
| Membership fees | | |
| | 61,120 | 48,800 |
| Other income | | |
| Sundry receipts | 9,489 | - |
| | <hr/> | <hr/> |
| | 70,609 | 48,800 |
| Expenditure | | |
| Insurance | 1,859 | 1,851 |
| Sub contractor fees | 37,652 | 33,578 |
| Telephone, computer and website costs | 2,264 | 1,556 |
| Accountancy | 1,656 | 1,560 |
| Bad debts | - | 7,374 |
| | <hr/> | <hr/> |
| | 43,431 | 45,919 |
| | <hr/> | <hr/> |
| | 27,178 | 2,881 |
| Finance costs | | |
| Bank charges | 377 | 319 |
| | <hr/> | <hr/> |
| NET SURPLUS | 26,801 | 2,562 |
| | <u>=====</u> | <u>=====</u> |

This page does not form part of the statutory financial statements